SIMPLE AND COMPOUND INTERPHALANGEAL DISLOCATIONS OF THE FINGERS.

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THE chief interest attached to the treatment of these luxations arises more from the satisfaction of restoring to its normal function such an important part as the finger, than from the knowledge of having overcome a surgical injury in itself trivial.

Although such small anatomical parts are engaged, there is great difficulty often experienced in the treatment of these dislocations. This arises from two facts, (1) the part dislocated is of small size and permits of only a limited surface whereon to exert the necessary manœuvres for reduction, and (2) these are the points where great force, the result of muscular contraction acts with considerable mechanical advantage, and where of necessity ligamentous bonds of union are proportionately strong.

Again dislocations occurring in the fingers differ in some material respects from those observed in other parts. One is here dealing with a series of bones whose surroundings are so closely applied to them, that the space for dislocation in the ordinary sense does not exist; the skin forms a tight covering for all, and, should luxation occur, instead of taking place into a muscular plane, or a cellular space, it has of necessity (if not compound) to do so among very strong and tense anatomical structures. Moreover the movement of these joints is comparatively very extensive, and at the same time accurately defined so that in order to meet these requirements the ligaments are unusually strong and tense for articulations of their size. Further dislocation can only take place backwards, or at all events the main direction must be backwards, as, unless compound, the bones cannot be dislocated forwards owing to the extreme amount of flexion permitted by the configuration of their articulating surfaces.

To glance briefly at the anatomical arrangements of these joints one finds that as far as ligaments are concerned the bones are held together by lateral slips, the anterior and posterior being mere rudiments and practically composed of nothing, save the synovial membrane. The function of these ligaments is performed by the flexor and extensor tendons respectively. In addition to these structures there exists in front of the joint a "sesamoid body" composed of fibro-cartilage, and mainly attached to the base of the distal phalanx to aid its movements. It has no attachment to the flexor tendon. When the finger is extended to a straight line the attachments of this body are tense. It plays the same part to these joints that the sesamoid bones do to others, and affords a "*point d'appui*" on which the flexor tendon acts at the commencement of flexion. If the joint be forcibly extended until the bones are at a right angle,the attachment of the sesamoid body to the proximal phalanx must be torn, and by the tension on the flexor tendon, is liable to be pushed into the joint between the two phalanges. The flexor tendon is also either ruptured or drawn down from the fleshy part of the muscle. By this means the extensor tendon is left unopposed, and although it does not necessarily keep contracted, still when any effort is made to replace the dislocated bone, it involuntarily is contracted and to a greater extent than one might imagine, impedes the reduction.

Having thus far explained some of the chief circumstances bearing on these points I will briefly record four cases which came under my notice.

1. Female, æt. 39. She had a dislocation backward of the second phalanx on to the dorsal surface of the first phalanx of the little finger. The injury had lasted 17 days, and was caused by having the fingers crushed against the wall while in the act of moving heavy furniture. She sought advice as she was unable to use the finger. The rigidity of the parts was extreme. All forms of traction failed and finally I made use of a manœuvre that in Mr. Wheeler's hands has been attended with success in cases of Hey's luxation. By placing the dislocated joint on the edge of the table so that the dislocated bone should project beyond, and then fixing the hand, I then made pressure with the ball of the right thumb in the necessary direction, exerting the force against the base of the dislocated phalanx. The bone returned with a sudden jerk; the finger was then placed on a suitable splint and a few days subsequently the functions of the joint appeared quite normal.

2. The second case was that of a noted pugilist. He fell, while walking down the street, "on the points of his fingers," to use his own expression. The terminal phalanx of the thumb was dislocated backward, and to the radial side of the proximal phalanx. The fold of skin between the thumb and index finger was thrown into strong profile. Attempts at reduction by traction failed, as did also extreme flexion and extension. It was reduced by steady pressure exerted by the surgeon's thumb on the bone of the dislocated phalanx in a direction contrary to that the dislocation had taken.

3. The third case was a compound luxation of the ungual phalanx of the right index finger forward, the result of the finger being caught in a door. The subject of this injury was a young gentleman who had passed the examination for the Civil Service of India on probation. The deformity was easily reduced, but the extensor tendon had been cut across and the ends of the bones somewhat injured. The case appeared most unfavorable, but as he was anxious to preserve his finger intact, I resected the joint and obtained a complete recovery with very little shortening. Perhaps the best proof of the success that attended the proceeding is that Sir William Gull passed him as fit at a subsequent physical examination.

4. The recipient of this injury was an artillery man. He fell, while walking with a drunken friend. In endeavoring to save himself, he stretched out his hand, and received the additional weight of his companion who fell with him. He paid no attention to the injury till next morning, and when he came under observation his hand was covered with mud. He had sustained a compound luxation backward of the terminal phalanx of his thumb. There was extreme swelling of all parts of the thumb, and all efforts made at reduction failed utterly. I consequently gave him treatment calculated to allay the inflammation and quiet the nervous system. The following day he returned, complaining of pain running up his arm, and the swelling had advanced considerably upward. The usual attempts at reduction failed as before. I, therefore, tenotomized the extensor secundi internodii pollicis, as it emerges from beneath the posterior annular ligament. I

chose this position because the tendon could be easily localized there, and also because it was well removed from the seat of inflammation. Reduction was now easily effected. Considerable inflammatory action occurred in the seat of dislocation, but the progress to recovery was uninterrupted. I have seen him since, and except that the joint is somewhat stiff the thumb is as useful as ever.

If we consult the great surgical authorities on this subject, we find that although most of them acknowledge the difficulties attending the treatment of these injuries, (and I wish to lay stress on the fact that I am excluding dislocations occurring at the metacarpo-phalangeal joints), very few suggest any definite line of treatment. Thus Erichsen states that he does not believe simple dislocations of the ungual phalanx from the second can occur.

Nélaton has only known of four cases, and states that one of them, although seen early and treated by some of the best Parisian surgeons, remained irreducible. He states further that he only saw one himself (compound) which remained unreduced. He advises the removal of the articular ends to facilitate reduction.

Agnew also advises the removal of the articular ends in compound cases "if the phalanx cannot be replaced with entire ease, or, when restored to position has a tendency to relaxation." In the only case Gross saw, although he reduced it, he had finally to resort to amputation.

In Hamilton's work on dislocations he says, "such injuries attended with laceration of the integuments may occasionally require amputation or resection of the bones." Mr. Pickering Pick recommends amputation if the soft parts are freely destroyed.

In Dr. Terrilon's work (*Lecons Cliniques*) on the effects of muscular action in dislocations he states that Bell, Hey (*Archives of Medicine*, 1867) Valentine, Vast (quoted in Hamilton) and Dieffenbach (*Medicin Zeitung* 1840), all practice subcutaneous section of tendons in order to aid the reduction of dislocations of a recent or old standing, but the dislocations referred to are those of the larger joints. In the *Lecons Orales* (ii, p. 46) Dupuytren says, "although at first sight interphalangeal dislocations appear of trivial consequence yet they often become of extreme interest owing to the difficulty of reducing them and in some cases the inability to do so." He concludes the difficulty arises from the interposition of the flexor tendon, believing the lateral ligaments are invariably torn, and he recommends as the only remedy for this section of the flexor tendons in close proximity to the joint.

Professor Humphry mentions two cases that occurred in the practices of Bourbon and Roun, and in these the difficulty was produced by the intervention of the sesamoid body. He also says that he found it necessary to introduce a hook and draw the sesamoid forward before reduction was completed.

In the *Gazette des Hôpitaux* M. LeBlanc records an interphalangeal dislocation successfully treated by the method advocated by Guermonprez which consists of pushing the dislocated parts back with the thumbs, the index fingers tightly grasping the phalanx from which the dislocation has occurred as a counterforce. Velpeau says (*Bulletin gén. de thérap.*) with reference to these luxations occurring in the thumb, "some of them return as by magic, but others remain irreducible in spite of the most persistent and well directed attempts."

With reference to the treatment I adopted in these cases some may question the advisability of tenotomizing the opposing muscle, when we have the relaxation produced by anæsthetics to fall back on. No doubt while anæsthesia exists the the reduction may be accomplished, but when one or more tendon has been left unopposed there is great liability for the deformity to return as soon as the effects of anæsthesia have passed off.

Most of the apparatus that have been invented to effect reduction in these cases are useless because they all act by traction. Thus Levis' apparatus, the Indian puzzle, Charriere's forceps, etc., act in this way, and the reason their application is so often followed by disappointment, is (in cases of interphalangeal dislocations) the result of two causes: firstly, the inability to exert sufficient force owing to the limited surface on which to get a purchase, and, secondly, that all attempts made by traction on the dislocated part only tend, by tightening the ligaments, tendons and other structures to increase the immobility of the parts.

Judging from the experience I obtained from the above cases., I think in simple dislocations the best means to obtain replacement is direct pressure exerted by means of the thumbs on the dislocated part, and failing to reduce in that manner tenotomizing of the extensor tendons, for it is only in dislocation backwards that there is any difficulty in reduction, forward dislocation being impossible unless compound in which case the extensor tendon is always torn. The tenotomy further aids the treatment, as it allows perfect rest to the parts which in the case of compound dislocation is so essential.

Should the dislocation be compound, and especially if the cartilaginous ends of the phalanges be injured, I think the best results will follow the removal of as much of the cartilaginous surface as possible by means of a scalpel.